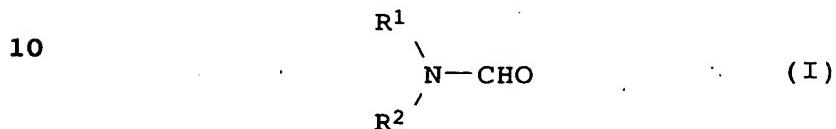


We claim:

1. A process for the preparation of carbonyl chlorides by
 5 reacting carboxylic acids with phosgene or thionyl chloride
 in the presence of a catalyst adduct of an N,N-disubstituted
 formamide of the formula (I)



15 in which R¹ and R² independently of one another are C₁- to
 C₄-alkyl or R¹ and R² together are a C₄- or C₅-alkylene chain,
 and phosgene or thionyl chloride, which comprises introducing
 hydrogen chloride during and/or after the reaction.

2. A process as claimed in claim 1, wherein, overall, a molar
 20 amount of hydrogen chloride of 0.2 to 2.0, based on the molar
 amount of carboxylic acid employed, is used.
3. A process as claimed in claims 1 to 2, wherein, in the
 25 reaction with phosgene, a molar amount of N,N-disubstituted
 formamide (I) of 0.05 to 2.0, based on the molar amount of
 carboxylic acid employed, is used.
4. A process as claimed in claims 1 to 2, wherein, in the
 30 reaction with thionyl chloride, a molar amount of
 N,N-disubstituted formamide (I) of 0.001 to 0.05, based on
 the molar amount of carboxylic acid employed, is used.
5. A process as claimed in claims 1 to 4, wherein, during the
 35 reaction, a molar amount of phosgene or thionyl chloride of
 1.0 to 2.0, based on the molar amount of carboxylic acid, is
 used.
6. A process as claimed in claims 1 to 5, wherein the molar
 40 proportion of the catalyst adduct of the N,N-disubstituted
 formamide (I) and phosgene or thionyl chloride, based on the
 molar amount of N,N-disubstituted formamide (I) plus catalyst
 adduct, is less than 0.3 after the reaction.
7. A process as claimed in claims 1 to 5, wherein the molar
 45 proportion of the catalyst adduct of the N,N-disubstituted
 formamide (I) and phosgene or thionyl chloride, based on the

molar amount of N,N-disubstituted formamide (I) plus catalyst adduct, is less than 0.1 after the reaction.

8. A process as claimed in claims 1 to 7, wherein the carbonyl chloride is isolated from the reaction mixture following the reaction by phase separation.
- 5
9. A process as claimed in claims 1 to 8, wherein the N,N-disubstituted formamide (I) used is
- 10 N,N-dimethylformamide.
- 15
10. A process as claimed in claims 1 to 9, wherein, following the reaction, the N,N-disubstituted formamide (I), its hydrochloride and catalyst adduct are separated off and reused as catalyst precursor in the carbonyl chloride synthesis.
11. A process as claimed in claims 1 to 10, wherein the carboxylic acids are reacted with phosgene.
- 20
12. A process as claimed in claims 1 to 11, wherein the carbonyl chlorides prepared are acetyl chloride, propionyl chloride, butyryl chloride, valeryl chloride, isovaleryl chloride, pivaloyl chloride, caproyl chloride, 2-ethylbutyryl chloride, enanthyl chloride, capryloyl chloride, 2-ethylhexanoyl chloride, pelargonoyl chloride, isononanoyl chloride, capryl chloride, neodecanoyl chloride, lauroyl chloride, myristoyl chloride, palmitoyl chloride, stearoyl chloride, oleoyl chloride, linoleoyl chloride, linolenoyl chloride, arachidoyl chloride and behenoyl chloride, and mixtures thereof.
- 25
- 30

Process for the preparation of carbonyl chlorides

Abstract

5

Process for the preparation of carbonyl chlorides by reacting carboxylic acids with phosgene or thionyl chloride in the presence of a catalyst adduct of an N,N-disubstituted formamide of the formula (I)

10



15

in which R¹ and R² independently of one another are C₁- to C₄-alkyl, or R¹ and R² together are a C₄- or C₅-alkylene chain, and phosgene or thionyl chloride, in which hydrogen chloride is added during and/or after the reaction.

20

25

30

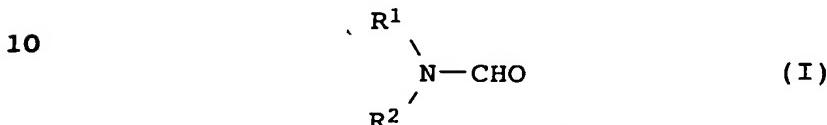
35

40

45

We claim:

1. A process for the preparation of carbonyl chlorides by
 5 reacting carboxylic acids with phosgene or thionyl chloride
 in the presence of a catalyst adduct of an N,N-disubstituted
 formamide of the formula (I)



15 in which R¹ and R² independently of one another are C₁- to
 C₄-alkyl or R¹ and R² together are a C₄- or C₅-alkylene chain,
 which comprises introducing hydrogen chloride during the
 reaction.

2. A process as claimed in claim 1, wherein, overall, a molar
 20 amount of hydrogen chloride of 0.2 to 2.0, based on the molar
 amount of carboxylic acid employed, is used.
3. A process as claimed in claims 1 to 2, wherein, in the
 25 reaction with phosgene, a molar amount of N,N-disubstituted
 formamide (I) of 0.05 to 2.0, based on the molar amount of
 carboxylic acid employed, is used.
4. A process as claimed in claims 1 to 2, wherein, in the
 30 reaction with thionyl chloride, a molar amount of
 N,N-disubstituted formamide (I) of 0.001 to 0.05, based on
 the molar amount of carboxylic acid employed, is used.
5. A process as claimed in claims 1 to 4, wherein, during the
 35 reaction, a molar amount of phosgene or thionyl chloride of
 1.0 to 2.0, based on the molar amount of carboxylic acid, is
 used.
6. A process as claimed in claims 1 to 5, wherein the molar
 40 proportion of the catalyst adduct of the N,N-disubstituted
 formamide (I) and phosgene or thionyl chloride, based on the
 molar amount of N,N-disubstituted formamide (I) plus catalyst
 adduct, is less than 0.3 after the reaction.
7. A process as claimed in claims 1 to 5, wherein the molar
 45 proportion of the catalyst adduct of the N,N-disubstituted
 formamide (I) and phosgene or thionyl chloride, based on the

molar amount of N,N-disubstituted formamide (I) plus catalyst adduct, is less than 0.1 after the reaction.

8. A process as claimed in claims 1 to 7, wherein the carbonyl chloride is isolated from the reaction mixture following the reaction by phase separation.
5
9. A process as claimed in claims 1 to 8, wherein the N,N-disubstituted formamide (I) used is
10 N,N-dimethylformamide.
10. A process as claimed in claims 1 to 9, wherein, following the reaction, the N,N-disubstituted formamide (I), its hydrochloride and catalyst adduct are separated off and
15 reused as catalyst precursor in the carbonyl chloride synthesis.
11. A process as claimed in claims 1 to 10, wherein the carboxylic acids are reacted with phosgene.
20
12. A process as claimed in claims 1 to 11, wherein the carbonyl chlorides prepared are acetyl chloride, propionyl chloride, butyryl chloride, valeryl chloride, isovaleryl chloride, pivaloyl chloride, caproyl chloride, 2-ethylbutyryl chloride,
25 enanthyl chloride, capryloyl chloride, 2-ethylhexanoyl chloride, pelargonoyl chloride, isononanoyl chloride, capryl chloride, neodecanoyl chloride, lauroyl chloride, myristoyl chloride, palmitoyl chloride, stearoyl chloride, oleoyl chloride, linoleoyl chloride, linolenoyl chloride, arachidoyl chloride and behenoyl chloride, and mixtures thereof.
30